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This study demonstrated reinforcement control over pronounced feminine behaviors in a male child. The clinical history of S paralleled the retrospective reports of adult transsexuals, including (a) cross-gender clothing preferences, (b) actual or imaginal use of cosmetic articles, (c) feminine behavior mannerisms, (d) aversion to masculine activities, coupled with preference for girl playmates and feminine activities, (e) preference for female role, (f) feminine voice inflection and predominantly feminine content in speech, and (g) verbal statements about the desire or preference to be a girl. S was treated sequentially in the clinic and home environments by his mother who was taught how to reinforce masculine behaviors, and to extinguish feminine behaviors. During this treatment, S's feminine behaviors sharply decreased and masculine behavior increased. A multiple-baseline intrasubject design was used to insure both replication and reliable identification of relevant treatment variables. (Author/LAA)

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Behavioral Treatment and Assessment of Childhood Cross-Gender Problems[1]

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ABSTRACT

This study demonstrated reinforcement control over pronounced feminine behaviors in a male child who had been psychologically evaluated as manifesting "childhood cross-gender identity." The clinical history of S paralleled the retrospective reports of adult transsexuals, including (a) cross-gender clothing preferences, (b) actual or imaginal use of cosmetic articles, (c) feminine behavior mannerisms, (d) aversion to masculine activities, coupled with preference for girl playmates and feminine activities, (e) preference for female role, (f) feminine voice inflection and predominantly feminine content in speech, and (g) verbal statements about the desire or preference to be a girl.

S was treated sequentially in the clinic and home environments by his mother, who was trained by us to be his therapist. The mother was taught how to reinforce masculine behaviors, and how to extinguish feminine behaviors, by using a token reinforcement procedure. During this treatment, his feminine behaviors sharply decreased and masculine behavior increased. The treatment effects were found to be largely response-specific and stimulus-specific; consequently, it was necessary to strengthen more than one masculine behavior and weaken several feminine behaviors, in both clinic and home settings. A multiple-baseline intrasubject design was used to insure both replication and reliable identification of relevant treatment variables. This study suggests a preliminary step toward correcting pathological sex-role development in boys, which may provide a basis for the primary prevention of adult transsexualism, or similar adult sex-role deviation. The findings were discussed in terms of the major theories of sex-role development.

Young boys with feminine sex-typed behaviors have recently become the object of increased psychological interest, perhaps because of growing evidence that childhood cross-gender manifestations are indicative of later adult sexual abnormalities, e.g., transvestism, transsexualism, or some forms of homosexuality (Green, 1967, 1968; Green and Money, 1961, 1969; Stoller, 1968, 1970). Anatomically normal male children with pronounced feminine characteristics are now diagnosed as having childhood "cross-gender identity problems" (e.g., Green, 1968).

This paper will report the first of several children we have treated with the purpose of normalizing their sex-typed behaviors. This boy, Kraig, was referred to us by a physician for treatment at the age of 4 years and 11 months. His family was intact, including a normal brother of 8 years and a sister of 9 months of age. He exhibited all the psychiatric symptomatology of a typical boy with "cross-gender identification." The referring physician had found Kraig to be physically normal in terms of currently available methods of bio-medical testing. Prior to treatment, Kraig had been described by a psychiatric authority on gender identity problems as one of the most severe cases he had assessed. He had a history of cross-dressing since he was 2 years old; at that time, he also began to play with cosmetic items of his mother and grandmother. When the mother's clothing was unavailable, Kraig very frequently improvised in cross-dressing--e.g., mop or towel over head for long hair, or long shirt for a dress. Kraig continually displayed pronounced feminine mannerisms, gestures, and gait, as well as exaggerated feminine inflection and feminine content of speech. He had a remarkable ability to mimic all the subtle feminine behaviors of an adult woman. At the same time, he seemed void of masculine behaviors, being both unable and unwilling to play the "rough-and-tumble" games of boys his age in his immediate neighborhood. He regularly avoided playing with his brother; he declined to defend himself among peers; and he was very fearful of getting hurt. On the other hand, he preferred to

play with girls, and one neighbor girl in particular; even when playing house with the girls, he invariably insisted on playing the part of the "mother" and assigned the part of "father" to one of the girls. Kraig had a very dependent, immature relationship with his mother; he demanded her attention almost continuously. He appeared to be very skilled at manipulating her to satisfy his feminine interests (e.g., he would offer to "help mommy" by carrying her purse when she had other packages to carry). He seemed almost compulsive or "rigid" in the extent to which he insisted on being a girl and in his refusal of all contact with masculine-like activities. From casual observation, normal 5-year-old girls show much more flexibility than Kraig did in choosing between sex-typed behaviors.

There are at least four related reasons why one may want to treat a child like Kraig. First, Kraig's feminine behavior was increasingly leading him to social isolation and ridicule. Boys like Kraig are typically scorned by their peers and live a miserable social life (cf., Stoller, 1970). While society probably could afford to become more tolerant with individuals with sex-role deviations, the facts remain that it is not tolerant and, realistically speaking, it is potentially more difficult to modify society's behaviors than Kraig's, in order to relieve Kraig's suffering. Secondly, since Kraig had these problems before the age of 5 years, our best prediction (based on the literature) would indicate that he will have even more severe adjustment problems in adulthood. Most adult transsexuals and transvestites and some homosexuals report that their cross-gender behaviors began in early childhood (Green, 1968; Money and Primrose, 1968; Walinder, 1967; Zuger, 1966). It appears to be the case, in boys at least, that substantial deviation from appropriate sex-role behavior at the age of 5 leads to substantial gender problems in adulthood, in the majority of cases (cf., Green and Money, 1969). Adult cross-gender psychopathology not only develops early in childhood, but also contributes developmentally to difficulties in social relationships, so that by adulthood, the syndrome is frequently accompanied by other serious emotional, social and economic maladjustments. For example, the literature reports (1) the most frequent accompanying psychopathology is depression (Pauly, 1969)--67% of the male transsexuals are thought to suffer intermittent depressive reactions, with suicidal ideation (60 per cent), and actual suicide attempt in

17 per cent (Pauly, 1965) to 20 percent (Walinder, 1967; (2) self-mutilation in the form of autocastration or autopenectomy was attempted in 18 per cent and accomplished in 9 per cent of one series of adult cases (Pauly, 1965): (3) the most common "treatment" imposed by society for transsexuals is arrest, trial, and imprisonment (Money, 1968); and (4) a recent study of the social and economic aspects of transsexualism found a high incidence of educational and work maladjustments, as well as a high proportion of criminal and other anti-social behavior (Hoenig, Kenner & Youd, 1970). A third reason for treating Kraig is that intervention on deviant sex-role development in childhood may be the only effective manner of treating (i.e., preventing) serious forms of sexual deviance in adulthood, since in adulthood such severe deviance appears to be quite resistant to psychological treatment. Because adult transsexuals are extremely discontent, and because all efforts to change their gender identity to match their anatomy have failed, many clinicians have concluded that surgical and hormonal sex-reassignment is the only ameliorative treatment available (Money, 1970; Baker & Green, 1970; Randell, 1970). Adult transsexuals request sex-reassignment surgery, typically complaining, "I have a woman's mind trapped in a man's body." With the many surgical, psychological, legal, and ethical problems raised with attempted sex-reassignment procedures (cf., articles in Green and Money, 1969), it may be preferable to attempt to change the individual's "mind" (behavior) during the formative childhood years than to change the adult's body. Finally, Kraig's parents, who might have found his feminine gestures amusing at the age of 2, were very alarmed when they "got out of hand" at 5 years, and they strongly wanted him to receive professional help.

Current understanding is incomplete regarding the environmental conditions under which normalization of sex-role behavior could be accomplished. The lack of positive results from all major forms of psychological treatment for the adult transsexual (Benjamin, 1969; Baker, 1969; Pauly, 1969) calls for study to discover effective techniques for therapeutic intervention at an early developmental stage. Given that gender-related behaviors are established early in life (Green and Money, 1969; Hampson, 1965; Harlow, 1965) and are probably more susceptible to therapeutic intervention at such a time, it seems logical to attempt

to study and treat cross-gender problems in early childhood. Unfortunately, however, the literature on children (as with the adult cases) does not specify what we could do to help a child like Kraig. Therefore, our job became one of exploring, from the beginning, what environmental manipulations we could make to normalize Kraig's deviant sex-role behavior.

We chose to focus our treatment approach around social learning contingencies. Social learning variables have been generally considered to be the main source of sex-role deviance, although biological malfunction may be a potential contributing factor. A body of clinical literature suggests that the factors controlling human cross-gender behaviors are particular to an individual's immediate family setting or shared in a certain cultural milieu (e.g., Litin, Griffin & Johnson, 1956; Lukianowicz, 1959; Pauly, 1969; and Stoller, 1969). Most investigators have accepted the compelling evidence for an environmental etiology provided by Money, Hampson, & Hampson (1955) who reported that the gender role and orientation of individuals born with ambiguous sex (hermaphrodites) are correlated with sex of assignment and rearing, and not correlated with any one of the five physical variables of sex. Recently, however, the conclusions derived by Money et al. from their data have been challenged (Zuger, 1970) and the potential influence of biological variables on gender identity has been suggested by recent findings (e.g., Evans, 1972). Clearly, more research is needed to determine the controlling variables in the development of sex-role behavior, and thus this area of investigation is a good testing ground for the evaluation of social learning theory.

Method

Employing a multiple baseline design across behaviors and situations, we trained several gender-related behaviors (such as peer-play, doll-play, mannerisms, etc.) both in the clinic setting and in the child's home.

Observational Measures in the Clinic

The child was first observed and treated in the clinic, so we will describe the physical set-up there first. S was brought into a play-room furnished with various sex-typed toys placed on two child-sized tables (2 ft. high; 5 x 2½ ft. top surface). "Boys' toys" were placed on one end of each table, and "girls' toys" were placed on the other end.

The quantity and quality of the boy and girl toys were roughly equated.

One of the tables (Dress-Up Table) had clothing and grooming toys on it. On one side were girls' cosmetic articles and girls' apparel, consisting of a woman's wig, a long-sleeve dress (child's size), a play cosmetic set (lipstick and manicure items), and a set of jewelry consisting of bracelets, necklaces, rings, and earrings. These toys had been sex-typed as feminine by several investigators (Brown, 1956; Lefkowitz, 1962; Rabban, 1950; Sutton-Smith, Rosenberg, & Morgan, 1963). On the other side of the Dress-Up Table were boys' apparel, namely a plastic football helmet, a sea captain's hat, an army helmet, an army "fatigue" shirt with stripes and other military decorations, an army belt with hatchet holder and canteen holder, and a battery-operated play electric razor. This second set of toys had been sex-typed as masculine in several studies (Brown, 1956; Lefkowitz, 1962).

The second table (Affect Table) was also divided in two parts. On one side were placed girl toys associated with maternal nurturance, namely a baby doll in a 3-foot crib with sliding side, a baby bottle, baby powder, a "Barbie" doll with two sets of dresses, shoes, hat and miniature clothesline. Many investigators have sex-typed these toys as feminine (Brown, 1956; Fagot & Patterson, 1969; Hartley & Hardesty, 1964; Rabban, 1950; Sutton-Smith et al., 1963; Vance & McCall, 1934; Ward, 1963). On the other side were placed articles associated with masculine aggression, consisting of two dart guns with darts, a small target, a rubber knife, plastic handcuffs, a set of plastic cowboys and Indians (42 pieces, 2 inches tall each). This second set of toys had been sex-typed as masculine (Brown, 1956; Hartley & Hardesty, 1964; Sutton-Smith et al., 1963; Walker, 1964). This toy table is abbreviated as "Affect Table" since the toys provide the opportunity for sex-typed affect expression--either maternal nurturance or masculine aggression.

The child's verbal behavior and play with these toys was recorded from behind a "one-way window" on a General Electric Tri-Pac closed-circuit television monitoring system. Simultaneously, the child's play and verbal behavior was recorded from behind the "one-way window" by two observers (Os) on a Multiple Push-Button Response Panel with two sets of keys for independent behavior rating. The Response Panel was wired to the Commercial Controls Corporation Motorized Tape-Punch,

Model 2, which records key position every 1-second, on a Hewlett-Packard computer punch tape.

Procedure. Each time S came to the laboratory for a session, he was given the opportunity to play on the Dress-Up Table for one 5-minute play period, and on the Affect Table for another 5-minute play period.

Each play period was separated from the next by a 2-minute "break." The order in which the two tables were presented was randomized for each session. Each session was spaced from 1 to 2 days apart, on the average. By obtaining independent observational measures of masculine play and feminine play on the Dress-Up and the Affect Table, a multiple baseline was obtained over five or six sessions.

E led S into the experimental (play) room and gave these instructions:

> When I leave the room, you may play with any of the toys on this table (pointing). Even though you will not see me, I can see you play; so, I will know if you are playing with this table or a wrong table. So remember, choose toys to play with from this table only.

The child was restricted by instruction to play with only one of the two toy tables present in the room for two reasons. First, it was found that pilot normal Ss frequently mixed toys from the two tables in their play, complicating the scoring. If S was restricted to one toy table at a time, he had an equal opportunity to play with each set of toys, and the behavior is relatively easy to score. Secondly, the instructions provided E with an opportunity to tell S that he was in fact being observed, thereby avoiding deception. S was left alone in the room for a 5-minute period, after which E re-entered the room and said: "Please put all the toys back on the table and come with me, now." E ignored S's questions and other verbalizations unrelated to the clarification of instructions.

After a stable baseline had been obtained, a non-interacting adult (a "probe" condition) was placed in the room while the child played on one of the tables. On the same day, the child played alone on the other table. The adult was instructed to passively watch S play, and to defer any questions S might ask until after the play period. Immediately prior to leading S into the room for this condition, E instructed S:

> This time your daddy (alternatively, mommy, or a stranger) will be in the room to watch you play. I told him/her not to play with the toys, but just to watch you play by yourself. Come with me into the playroom.

In all experimental conditions, O recorded appropriate play with masculine toys on the Multiple Push-Button Response Panel by depressing key number 1 for the duration that S was in physical contact with a

masculine toy, and used the toy for its intended purpose; similarly, key number 2 was pressed for the duration of appropriate play with feminine objects. These two response categories were defined to be mutually exclusive; Os were instructed not to score (1) inappropriate play (e.g., cross-gender role use of same-gender toy object, such as using the army belt for a bonnet), (2) feminine gestures, posturing, or gait, or (3) play in which S was in physical contact with a toy from both classes of toys. This kind of objective behavioral observation in a free play setting had been developed in detail by Lovaas, Freitag, Gold, & Kassorla (1965).

In order to obtain measures of observer reliability across several Os, three 20-second time samples were recorded on videotape for each 5-minute play period. A time sample was taken from each of the three successive 100-second intervals, according to a schedule which was determined by a random numbers table. The entire session was also recorded on audiotape, for complete transcription and scoring of verbal behavior.

Observer reliability. The reliability of the dependent measures was determined by two procedures:

(1) Observer reliability was checked periodically throughout the experiment by giving a second O an independent set of response panel keys during the session. The recordings of both Os were scored parallel on the same computer punch tape. By this procedure, observer reliability data was collected and correlation coefficients were calculated for masculine behaviors between O_1 and O_2 and between O_2 and O_3 for 10-minute sessions divided into 1-minute segments; similarly, reliability coefficients were calculated for observations of feminine behavior between O_1 and O_2 and between O_2 and O_3.

(2) After all data had been collected in the laboratory setting, three naive observers (O_4, O_5, and O_6) scored randomly selected videotaped time samples for masculine and feminine behaviors. These Os were completely unaware of the research purposes, experimental conditions, or diagnoses of Ss (whether normal or patient). Correlation coefficients were calculated separately for each behavior (masculine or feminine) on each table (Dress-Up and Affect).

In addition to recording masculine and feminine play behavior, we attempted to measure masculine and feminine content in speech. While in the playroom, Kraig's verbal behavior was taperecorded and scored from the tapes by Os who pressed the appropriate button key of the Button-Response Panel for the duration of each verbal phrase, depending on its content. Each verbal phrase was judged to fall into one of three mutually-exclusive content categories--feminine, masculine, or neutral. Table 1 presents examples of words which identified each phrase as

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Insert Table 1 about here

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belonging to the feminine, masculine, or neutral category. Phrases with ambiguous content were scored as neutral. O was instructed to press a button switch for the duration of each feminine verbal phrase and phrases with feminine voice inflection. Another button was pushed for the duration of each masculine verbal phrase, and a third button for neutral phrases. For each session, the per cent feminine speech and per cent masculine speech was calculated with reference to the total number of seconds of verbal behavior (total = feminine + masculine + neutral).

Observational Measures in the Home

A daily behavior checklist was developed for Kraig to obtain reliable observational measures of his feminine behavior at home. The checklist form consisted of descriptions of frequently occurring feminine behaviors which were selected on the basis of the psychiatric referral information, interviews with the parents, and observations of the child's behavior made by the investigators in the clinic and home settings.

Specifically, the descriptions of feminine behaviors on the daily behavior checklist for Kraig were (a) "plays with girls," (b) "plays with female dolls," (c) "feminine gestures," which included limp wrist "swisky" hand, arm or torso movements, sway of hips, etc., and (d) "female role play," which included impersonating or pretending to be female (like actress, mother, female teacher) when playing games (like "house," "school," etc.). Kraig's mother was instructed to observe and record her son's behavior for 10 minutes at four specific times daily, according to a schedule mutually arranged with E. The recording was accomplished

by placing a check after the description of each behavior which was observed during that time period. Observer reliability for this time-sampling procedure was checked periodically throughout the study by home visits by research assistants. Very frequent reliability checks of this kind were made during the first 3 weeks of the procedure.

Treatment in the Clinic

After we had obtained baseline measures of the child's play in the clinic and home, we removed the Affect and Dress-Up Tables and began the treatment on S's play with a set of toys on what we called the "Therapy Table." This table contained toys that were different from those we used on the Dress-Up and Affect Tables, because we wanted to use the latter tables to assess generalization of treatment effects. The toys on the Dress-Up and Affect Tables will be referred to as the "generalization toys."

The toys on the Therapy Table most closely resembled those used by Rabban (1950) and the replication study by Sears, Rau, & Alpert (1965). The masculine-type toys were the following: (1) a plastic toy submachine gun, with moving trigger, but silent; (2) a highway road scraper, with adjustable blade; (3) a plastic race car with friction motor; (4) a plastic tugboat with moving helm and search light; (5) three miniature plastic soldiers; (6) a set of five small plastic airplanes; and (7) a plastic dump truck with moving dump mechanism. The feminine-type toys were the following: (1) a baby doll with feminine clothes and miniature nursing bottle; (2) a doll crib with moving side; (3) a doll Bathinette; (4) two purses, one child size and one doll size; (5) a doll Baby-tenda (feeding chair); (6) a set of plastic toy tea dishes: two cups, two saucers, silverware, and a teapot; and (7) a wicker doll buggy with moveable canopy. The crib, Bathinette, Baby-tenda, and buggy all had plain dolls in them. The following criteria for uniform attractiveness were met by all the above toys: (1) all had at least one moving part; and (2) none had more than two distinct possible types of manipulation.

Both the mother and Kraig were seated next to the table, facing the mirror so as to allow Os clear visibility of both. The mother wore a set of earphones which allowed E to communicate to her. Kraig's behavior on the Therapy Table was recorded in the same manner as we had recorded his behavior on the other tables.

The treatment procedure in the clinic. The procedure included several types of sessions: (1) baseline sessions, in which the child played with the generalization (Dress-Up and Affect) toys either alone or with an adult attending, (2) therapy sessions, in which the mother differentially reinforced the child for appropriate gender-related behaviors with the therapy toys, (3) generalization sessions, in which the baseline conditions were replicated to assess the treatment effect with the generalization toys, and (4) reversal sessions, in which the reinforcement contingencies with the therapy toys were withdrawn. We will explain each type of session in detail and explain the ordering of the sessions with reference to diagram in Table 2.

Insert Table 2 about here

Baseline sessions. Prior to the therapy sessions we had obtained baseline data on the child's verbal and play behavior on the Dress-Up and Affect Tables described above. We obtained two types of baseline sessions: (1) those in which the child was alone, and (2) those with an adult attending.

Therapy sessions. We treated the child in an attempt to extinguish feminine behavior and to shape masculine behavior. Each therapy session was ten minutes in length, during which time the following conditions were in effect. The mother was instructed to wear her earphones and to sit with a large book in her lap. She was told to selectively attend to masculine verbal and play behavior by smiling to Kraig and complimenting him on his play, and to ignore feminine behavior by picking up the book to "read." She was told that more specific instructions would be delivered over the earphones, to enable her to carry out these general instructions effectively.

E led the child into the room and seated him in the child's chair so that he faced his mother. The child was then instructed:

> You may play with any of the toys you like on the table (pointing), until I come back. You may talk with your mommy, too, if you want to. I'll be back in 10 minutes.

After 10 minutes, E re-entered the room and said: "Please put all the toys back on the table now, and come with me, Kraig." During the session, the mother was shaped to extinguish feminine behavior (verbal and play) by instructions over the earphones such as, "Stop talking to him now,"

"Pick up the book and read," "Ignore him now," "Look away from him." Immediately after the mother's correct response, E verbally reinforced her, e.g., "Good," "Great, that's what we want," "That's right," "Excellent." Similarly, if S picked up a masculine toy when the mother was not watching, E instructed her, "Quick, look at him now," or "Talk to him now."

Initially, a large number of prompting instructions were given, in conjunction with a large amount of E's approval. After four sessions, the prompts were largely faded out. The reinforcement schedule was continuous for several more sessions before it also was thinned. When Kraig began tantrum or other uncooperative behaviors (he typically did when his mother ignored him), E was particularly supportive of the mother. In fact, when the mother first withdrew her attention for Kraig's feminine play, he put so much "pressure" on her (by alternating between crying and aggressing at her) to reinstate the attention, that we had to terminate the session and ask Kraig to leave for a minute. Before sending Kraig back to the playroom, we reassured the mother empathetically that she was doing the right thing and doing it well, and that we would continue to be available in the observation room to help her.

Generalization sessions. After six consecutive therapy sessions, we ran two types of generalization sessions in which the child played alone and in adult-attending conditions on the Dress-Up and Affect Tables. This test provided a measure of the extent to which the treatment had changed the child's behavior when he was alone with similar, but different toys.

Reversal sessions. After the generalization sessions, Kraig and his mother were placed back into the therapy environment (with the Therapy Table), but the reinforcement contingency was removed. The mother was told to attend to all of her son's behavior indiscriminately. This allowed us to determine if the changes brought about by treatment were permanent or if they depended on continuing reinforcement. When the masculine behavior failed to extinguish after seven of these sessions, we terminated this treatment phase, being satisfied that the behavior change was reasonably durable. When the child's masculine behavior did extinguish, we reintroduced the therapy sessions (see Table 2),

After retraining, generalization sessions and reversal sessions followed again.

Treatment in the Home

Prior to and during the treatment in the clinic, Kraig's feminine behaviors were recorded in the home with the daily behavior checklist described above. This time-sampling procedure provided a baseline before clinic treatment and provided a means to test for generalization of treatment effect from the clinic to the home. These measures taken in Kraig's home indicated that the clinic treatment did not generalization to the home even though the mother was the therapist in the clinic. Therefore, we started a treatment program at home.

Kraig's mother was trained to mediate a token reinforcement system for her son at home. Both parents were asked to read Patterson and Gullion (1968), a programmed booklet for laymen explaining the application of reinforcement principles to childhood behavior problems. More detailed instruction on the administration of a token system was provided by the investigator. To assure that our instructions were accurately carried out by the parents, a research assistant was sent to the home for 45-minute sessions at least three times weekly for 4 months to observe the parent-child interaction, and to answer questions regarding the practical "day-to-day" operation of the token system. In addition, the investigators met with the parents together twice each month, assuring them that we would be "on-call" at all times if any questions arose concerning Kraig's home treatment. We also assured the mother that she had treated Kraig well in the clinic, and that we had great confidence in her ability to serve as Kraig's primary therapist at home, which is the role she was in fact assigned.

The mother selected, with our consultation, a set of "back-up" reinforcers (cf., Sherman & Baer, 1969) according to her boy's unique preferences for certain candies and rewarding activities (e.g., T.V. time). Red and blue standard poker chips were used as "tokens." The blue tokens, which came to serve as secondary positive reinforcers (S^{r+}), could be directly exchanged by Kraig for the "back-up reinforcers" according to a "price list" set by the mother (e.g., five blue tokens were required for a candy bar). The red tokens (S^{r-}) were discriminative

for a negatively reinforcing event, consisting of (a) a response-cost condition (i.e., red tokens were subtracted from accumulated blue tokens), (b) a time-out procedure (e.g., sitting in a corner, being deprived of T.V. time), or (c) physical punishment by spanking from the father.

Before introducing the token economy system to the feminine behaviors, it was judged "clinically safer" to initially apply it to non-gender behaviors in the home. This procedure had three purposes: (a) to test the mother's capability to consistently manage the contingencies, (b) to establish a clear discrimination between S^{r+} and S^{r-} contingencies for the child, and (c) to determine the strength of the S^{r-} contingency necessary to effectively suppress an undesired behavior in this child.

The token system on non-gender behaviors involved both S^{r+} and S^{r-} contingencies. Blue (S^{r+}) tokens were awarded for helpful, desired behaviors (e.g., brushing teeth, washing hands before eating, eating all food on plate, chores). Red (S^{r-}) tokens were given for tantrumous and disobedient behaviors (e.g., slamming doors, "cursing" at mother, tracking dirt on carpet, disturbing baby sister, and breaking household objects). The mother was instructed to verbalize the contingencies to her son and to make careful daily records of the occurrence of both the desired behaviors and the disobedient behaviors, on special mimeographed forms we provided. Reliability of the mother's records was checked by comparing her records to those of a research assistant who made two visits weekly to the home. The mother was required to sign a written contract with the investigators which specified that continued treatment was contingent upon the mother's success in carrying out two instructions: to take <u>reliable</u> observational data in the home, and to gain control over a non-gender-related behavior.

After the token reinforcement system had been successfully applied to the child's non-gender behaviors in the home, it was extended to gender-related behaviors. The mother introduced a negative reinforcement contingency (S^{r-}) for one particular kind of feminine behavior for a period of weeks. She was told to verbalize the new contingency and then apply it on a continuous schedule. We chose to apply the contingency to only one feminine behavior at a time because we wanted to avoid the possibility of "overwhelming" Kraig with too much negative reinforcement at any one time. After the first feminine behavior had been suppressed

for several weeks, the S^{r-} contingency was then introduced to a second feminine behavior in addition to the first. Similarly, the S^{r-} contingency was extended to a third feminine behavior after the second had been suppressed, and so on. These successive interventions permitted a replication of the S^{r-} contingency across behaviors in a multiple baseline design.

Results

The treatment results on Kraig may be summarized as follows. Kraig's sex-typed behaviors were strongly controlled by his mother's attention, and the mother was trained to successfully use her attention in a therapeutic manner, so as to decrease feminine and increase masculine behaviors in the clinic. More than one feminine behavior had to be suppressed and more than one masculine behavior increased; similarly, it was necessary to treat his behavior in more than one environment in order to observe a generalized change across situations. When differential reinforcement was discontinued early in the treatment, Kraig quickly reverted back to feminine behavior. With the continuation of treatment, the change in Kraig's behavior became more permanent. Follow-up data 2½ years after the treatment began suggests that his sex-typed behaviors have become normalized. Since we treated Kraig first in the clinic and subsequently in the home, we will present the results separately by setting.

Treatment in the Clinic

The reliability data for the dependent measures were obtained from the recordings of independent Os in two procedures. A comparison of the recordings across Os indicated a high degree of observer reliability. Whether calculated from the data obtained *in vivo* by two trained Os (procedure 1) or calculated from data obtained by "naive" Os viewing videotaped sequences (procedure 2). In both procedures, the Pearson "r" correlation coefficients were calculated for the categories of masculine and feminine behaviors separately between each pair of observers. For the purposes of calculation, the 10-minute sessions were divided into ten 1-minute segments, and the score for each consecutive 1-minute segment was the number of seconds that the given behavior was recorded.

For observer reliability procedure 1, the correlation coefficient between $\underline{O}_1$ and $\underline{O}_2$ was .98 for masculine behaviors across sessions, and .99 for feminine behaviors; between $\underline{O}_2$ and $\underline{O}_3$, the correlation was .99 for masculine behaviors and .94 for feminine behaviors. For reliability procedure 2, the correlation coefficients between "informed" $\underline{O}_3$ and "naive" $\underline{O}_4$, $\underline{O}_5$, and $\underline{O}_6$ ranged from 0.93 to 1.00, with a median of 0.97, indicating a high degree of agreement between pairs of Os.

The detailed results for Kraig's treatment in the clinic are presented in Figure 1, which shows sex-typed play behavior on the upper graph,

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Insert Figure 1 about here

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and the concurrent sex-typed verbal behavior on the lower graph for each session. Results will be presented in groups of sessions by experimental condition. The ordering of experimental conditions followed the diagram of Table 2.

Baseline: Sessions 1-16. In all types of baseline sessions, Kraig played almost exclusively feminine. This is particularly obvious when we inspect the upper half of Figure 1, which shows his feminine behavior to be at 100 per cent in almost all sessions, while his masculine behavior lies around 0 per cent. Kraig's verbal behavior (lower half of Figure 1) was either predominantly feminine or did not occur. As is given on the abscissa in the Figure, the baseline consisted of three types of conditions: (1) alone condition, (2) play with mother present, and (3) play with male stranger present. No differences were found in Kraig's play, whether he was alone or with either of the adults. The data for the two generalization tables (Dress-Up and Affect Tables) was averaged together for each session (1-16).

Therapy: Sessions 17-22. When the mother introduced the differential reinforcement with the Therapy Table toys, one can observe an immediate decrease in Kraig's feminine play and an immediate increase in masculine play.

Generalization test: Sessions 23-25. We withdrew the Therapy Table and introduced the generalization toys (Dress-Up and Affect Tables). We ran two kinds of generalization test sessions with the new set of toys: (a) play alone (sessions 23 and 24), and (b) play with mother present

(session 25). We found some, but limited, generalization during the alone conditions. (These sessions were different from treatment in that he was both alone and with different toys.) The treatment effect did generalize completely when the mother was present, even though the toys required a different set of behaviors. Kraig's masculine behaviors in session 25 contrasts markedly to the pre-treatment baseline (sessions 7 and 11) where he played feminine. This difference between Kraig's play when alone and in his mother's presence may be interpreted in terms of discriminative stimulus properties acquired by the mother in the therapy sessions.

Reversal: Sessions 26 & 27. We placed Kraig and his mother back into the room with the Therapy Table toys and withdrew the therapeutic contingency. In this condition, the mother was instructed to attend to all of her son's behaviors indiscriminately. This tested whether the acquired S^D properties of the mother would be maintained in the absence of the differential reinforcement. By session 27, Kraig's masculine play and masculine verbal behavior had extinguished. His feminine behavior rose to the baseline level.

Second set of therapy sessions: Sessions 28-32. When the reinforcement contingency was introduced by the mother for the second time, Kraig resumed masculine behavior, both play and verbal. This finding does of course provide the additional evidence we need in order to infer the effectiveness of the treatment variable. The quick reversal of Kraig's sex-typed behavior again suggested that he was responding to an S^D which signaled the change of reinforcing consequences, rather than acquiring new behavioral topographies.

Second set of generalization tests: Sessions 33-36. After the second set of therapy sessions, we tested for generalization a second time. The findings in the second set of generalization tests (sessions 33-36) exactly replicated the findings in the first set (sessions 23-25). Specifically, Kraig played totally masculine on the generalization toys in his mother's presence, but he played exclusively feminine with those toys when alone. Again, the treatment was found to be specific to the mother's presence, showing the situational nature of the treatment effect.

After obtaining this evidence that the treatment effect had generalized to play on a different set of toys in the mother's presence, we tested for generalization of treatment effects to the presence of a male stranger. In the baseline (session 13), Kraig's behavior (both play and verbal) was exclusively feminine in the company of a male stranger. This time, however, when a male stranger was introduced (session 36), Kraig played exclusively masculine. This indicated generalization of the treatment effect across two stimulus variables (a) to a different set of toys than used in therapy, and (b) to a different adult figure than the therapist. At this point in his treatment, however, he still remains feminine when alone.

Second set of reversal sessions: Sessions 37-39. During the second set of reversal sessions, Kraig's masculine behavior extinguished with the withdrawal of the reinforcement contingencies, and his feminine behavior increased. This replicated the first reversal sessions (26 and 27). In the absence of continued differential reinforcement, Kraig's behavior returned to the baseline level of feminine play and feminine verbalizations.

Third set of generalization tests: Sessions 45-48. After the third set of therapy sessions, we introduced generalization tests again. After previous treatment sessions, we had found generalization of treatment effects to play in the presence of the mother and male stranger, but not in the alone condition. Replicating previous generalization tests, Kraig's behavior was exclusively masculine in the presence of the mother and male stranger (sessions 47 & 48 respectively). Unlike previous generalization tests, however, Kraig now played totally masculine when alone with the generalization toys (session 45). However, his play returned to feminine in session 46. This suggested that by this time into the treatment we were beginning to observe some weak generalization of treatment effects to situations where he was alone. Such generalization had not been evidenced earlier in the treatment.

Third set of reversal sessions: Sessions 49-55. Kraig had had three sets of treatment sessions to this point. Now, when his mother withdrew the differential reinforcement contingency, the appropriate masculine behavior persisted, being evidently resistent to extinction.

At this point, the clinic treatment was terminated since we had sufficient evidence to conclude that (a) the changes in Kraig's sex-typed behavior were a function of the reinforcement contingency, and (b) the behavior change had some permanence in the mother's presence after removing the treatment conditions.

Final generalization test: Sessions 56-60. Through the course of treatment, the data indicated strong generalization of treatment effects to play with the generalization toys in the presence of adult figures. In contrast, we had only weak evidence for generalization to those situations where he was alone. This, of course, may suggest that he was "going underground" with his deviance, suppressing femininity in the company of adults. However, with increasing treatment there appears to be increasing generalization of the treatment effects. We can observe the beginning of such behavior by the third set of generalization test sessions. By the fourth set of generalization sessions, he played exclusively masculine (sessions 56 through 60).

On the basis of our data alone, we cannot determine the causal factors involved in this generalization effect. We could, in fact, have found the opposite--namely, increasingly quick behavioral reversals (decreasing generalization) with increasing number of reinforcement reversals. A partial explanation for the generalization effect may be derived from Kraig's verbal statement at the beginning of session 56; upon entering the room, Kraig said aloud, "I wonder which toys I will play with. Oh, these are girls' toys here, I don't want to play with them." Then Kraig commenced to play with the masculine toys. This spontaneous verbal labeling may, in part, account for Kraig's masculine play from that time on. However, in order to claim increasing generalization as a function of additional therapy, we need further replication across other Ss.

If the reader returns to the lower part of Figure 1, he can observe the changes in Kraig's verbal behavior as he progressed through treatment. These changes appear less clearly tied to the reinforcement manipulation than did the changes in his nonverbal (play) behavior. It is, however, apparent that masculine verbal behavior replaced feminine as treatment progressed.

We are confident that the changes in sex-typed behavior were a

function of our treatment variable, since we replicated the effect of the treatment in an experimental, intrasubject reversal or replication design. It is concluded that Kraig's sex-typed behavior was a function of the differential reinforcement contingency which constituted the treatment.

Treatment in the Home

A high degree of observer reliability was obtained for the dependent measure involving the daily behavior checklist. To determine the level of observer reliability, a comparison was made of the data obtained from independent time-sampled recordings on the home behavior checklist made by Kraig's mother and a research assistant (RA). The percentage of agreement on the occurrence of checklist behaviors was calculated weekly between the mother and RA. (Agreement on the non-occurrence of checklist behaviors was not included in the calculation, in order to obtain an accurate measure that would not be artificially inflated in cases where the behaviors occurred at extremely low frequencies.) The percentage of agreement between Kraig's mother and the RA ranged from 87 percent to 100 percent, with a median value of 94 percent.

Figure 2 indicates the baseline rate of four separate feminine

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Insert Figure 2 about here

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behaviors at home for 4 weeks before he received any treatment. During this baseline period, "play with girls" and "feminine gestures" occurred at a relatively high frequency (between 18 and 70 percent), while "play with dolls" and taking "female role in play" occurred at a more moderate frequency (between 0 to 12 percent). These four activities were the most pronounced feminine behaviors that Kraig displayed at home.

Beginning with week number five, the token reinforcement system was applied to non-gender behaviors. Beginning with week number seven, the clinic treatment for feminine behaviors was applied. Both of these interventions continued through the eleventh week. Figure 2 indicated that no systematic change in feminine behavior at home could be attributed to either one of these interventions.

The token system did result in an increase in Kraig's helpful, desired behaviors (e.g., brushing teeth, washing hands before eating, eating all food on plate, chores). But his tantrumous and disobedient

behaviors were not significantly suppressed with the application of red tokens (S^{r-}) which were backed up by the response-cost condition, the time-out procedure, or both. The disobedient behaviors did sharply decrease, however, when the red tokens were backed up by spanking. Kraig was told that he would get one "swat" from his father for each red token he collected. After receiving two swats in this manner for red tokens he had received while engaged in non-gender-related behaviors, Kraig carefully avoided receiving but a few red tokens from that time on, even though the treatment was to persist for more than half a year.

The token system was extended to gender-related behaviors in the twelfth week with the introduction of red tokens (S^{r-}) for Kraig's "play with dolls." As indicated on Figure 2, "play with dolls" which had varied between 0 and 15 percent during baseline, decreased completely and remained at the 0 rate every week after the introduction of this contingency. However, "feminine gestures" and "play with girls" continued at a rate comparable to the baseline weeks. Apparently, we could suppress feminine doll play without affecting other feminine behaviors. "Female role play" decreased to 0 during baseline (at week 10), two weeks prior to the introduction of the S^{r-} contingency for "play with dolls." It is unclear why "female role play" ceased; the data is inconclusive and no firm conclusion may be drawn regarding the variable controlling "female role play."

At week 21, red tokens (S^{r-}) were introduced for "feminine gestures." Feminine gestures had varied between 0 to 50 percent during baseline. When we applied the red tokens to the feminine gestures they dropped to 0 and stayed down in subsequent observations. Note that "play with girls" was unaffected by the contingencies for "doll play" and "feminine gestures."

The final S^{r-} intervention began at the 37th week with the introduction of red tokens for "play with girls." Kraig responded quickly to the new contingency, and ceased to play with girls totally for the remaining weeks with this contingency. Because of the replication of treatment effects across behaviors, we are reasonably sure that our reinforcement contingency was the variable responsible for the suppression of the feminine behaviors.

Informal Clinical Observations

At the end of the formal 10-month treatment program, and 20 months after the termination of the formal treatment, reports from Kraig's parents, neighbors, and school teacher concurred that he was indistinguishable from any other boy in terms of gender-related behaviors. We also sent one research assistant to Kraig's home environment and another assistant to his school to make recorded observations of his sex-typed behavior. The assistants were total strangers to Kraig, thus eliminating any possibility that they would be associated by him with our treatment program. The observations of the assistants concurred with the reports of the teacher and parents, providing evidence for the stability of the therapeutic effects. None of Kraig's pre-treatment feminine behavior was reported in these follow-up observations.

Improvement was also reported in Kraig's relationship with his father, brother, and male peers. Before treatment Kraig would passively allow his brother to tease him without asserting himself in return; in contrast, follow-up observations indicated that Kraig now regularly returned aggressiveness in his male peer interaction. Before therapy, Kraig was a "crybaby" being afraid to hurt himself in rough games; after the reinforcement therapy, Kraig was playing with "rough-neck" Kenny next door to the extent that Kraig was acquiring Kenny's mildly destructive and reckless behaviors. Interestingly enough, Kraig's mother began to complain to us that her son had become a "rough-neck" and was thereby in danger of getting hurt in reckless play as well as endangering furniture and other household items. We reassured the mother that such "mildly delinquent" behavior was much easier to correct in future years than feminine behaviors would be. Before treatment, Kraig and his father did not enjoy each other's company, but after treatment, Kraig became interested in week-end camp-outs and weekly "Indian Guide" club meetings with his father. His mother reports that Kraig now looks "more like a typical boy" in his appearance since he is no longer "fussy" about color-coordinating his clothes and keeping his hair neat; unlike his behavior before treatment, Kraig now likes to wear bluejeans, tennis shoes and boots, and he no longer complains when his hair is messed up.

Kraig's feminine behaviors have apparently ceased entirely, and he has developed some masculine behaviors in their place. However, our clinical impression is that he may still have a deficit in some desired masculine play skills.

The durability of the treatment effects (the effects gave every evidence of being permanent some 20 months after he was formerly terminated by us) was very likely a function of the mother's acquired skills in behavior modification, which extended the treatment program indefinitely on an informal basis throughout Kraig's environment. Prior to therapy, the mother had felt personally responsible for Kraig's pathology and she reported considerable guilt feelings, worthlessness as a mother, and confusion about what to do. After the treatment, however, she felt as though she had been able to actively help by being the therapist, and acted with considerably more confidence and assurance.

Discussion

We will discuss the data first in terms of their contribution to treatment of severe deviance in childhood sex-role behavior, and secondly, we want to relate our data to theories of sex-role development in normal children.

Before we introduce these specific speculations, however, let us offer some general evaluation of our data. First of all there is no doubt that our treatment intervention produced a profound change in Kraig. When we first saw him, the extent of his feminine identification was so profound (his mannerisms, gestures, fantasies, flirtations, etc., as shown in his "swishing" around the home and clinic, fully dressed as a woman with long dress, wig, nail polish, high screechy voice, slovenly-seductive eyes, were so extremely feminine) that they suggested irreversible neurological and biochemical determinants. At the 20-month follow-up he looked and acted like any other boy. People who view the videotaped recordings of him before and after treatment talk of him as "two different boys." At this time we also have several similar boys in treatment with similar therapy outcomes (cf. Rekers & Lovaas, 1971; Rekers, 1972). Therefore, we have some confidence that our treatment results will generalize across children, particularly if these children are quite young (less than 7 years of age).

However, it is wise to entertain two reservations. We do not know yet the extent to which we have produced changes in future preference for sex mates. Perhaps preference for sex mate is a response which is independent of the ones we treated. Only follow-up psychological evaluations on these children at 15 to 20 years of age will help to determine that. Only such data will allow us to claim a preventative treatment or cure for the severe adult sexual pathologies of transvestism, transsexualism, or some forms of homosexuality.

One should also be aware that there exists currently no other objective or systematic work on environmentally-induced changes in sex-role behavior which could serve to replicate our findings, although there are case histories of such changes (Myrick, 1970; Green, Newman, and Stoller, 1972). The sparsity of controlled research on the subject led Mussen (1969) to observe that "...there are no definitive studies relating reliable and objective observations of parental rewards and punishments to children's sex-typed behavior" (pp. 714-715). The present investigation of reinforcement control over cross-gender behavior in a male child appears to be the first experimental study on the subject.

Given these reservations, let us now briefly discuss what our present data suggest.

Treatment Data

From the social learning framework, it might be expected that the therapeutic reinforcement contingency would result in an acquisition learning curve for masculine behavior, with an extinction curve for feminine behavior. The long clinical history of Kraig's cross-gender behavior suggests that the acquisition of masculine behaviors and the extinction of feminine behaviors might be a very gradual process, necessitating complex shaping procedures to establish a verbal repertoire of predominantly masculine themes and to establish masculine patterns of play behavior. This would hold true if the boy had, in fact, a genuine behavioral deficit in the area of gender-appropriate play and verbal responses. The clinic data for Kraig suggests, in contrast, that some appropriate masculine play and verbal behaviors existed in the child's behavioral repertoire before treatment began. The immediate change to gender-appropriate responses with the instatement of the therapeutic reinforcement contingency most likely represents Kraig's discrimination

of the reinforcement contingency. The immediate reversal to feminine responding with the removal of the contingency is more characteristic of stimulus control rather than reinforcement control.

In the clinic laboratory setting, at least, it appeared to be more difficult to obtain control over verbal behavior than nonverbal play behavior. In the clinic treatment of Kraig, the changes in nonverbal behavior were clear and consistently a function of the experimental conditions. While the verbal behavior generally tended to follow the qualitative changes occurring with the nonverbal behavior (i.e., with respect to the masculine-feminine dichotomy), the correlation between masculine nonverbal and masculine verbal behavior was weak; the correlation between feminine nonverbal and feminine verbal was also weak. Perhaps the variables which control verbal behavior in this setting were too numerous and complex for systematic investigation with the present experimental procedure.

We found relatively little evidence for response generalization. The treatment was largely specific to the behavior to which it was applied. There were two possible exceptions to our data: (1) "Female role play" for Kraig might have been suppressed by our treatment of "doll play." The evidence is equivocal, however, since "female role play" occurred so infrequently during the initial baseline period and actually ceased completely for the 2 weeks immediately prior to treatment for "doll play." We have no real evidence, therefore, for any generalization of treatment across behaviors in the home. (2) In the clinic, we found some generalization across behaviors, as occurred from the Treatment toys to the Affect and Dress-Up toys. However, only weak generalization, if any, was found to these (Affect and Dress-Up) toys in the "alone" play condition. This suggests that it was the mother who facilitated response generalization. Additional research is needed to determine the treatment conditions under which maximal response generalization may be obtained.

Just as we observed limited response generalization, we also found limited stimulus generalization. For example, even though the mother became discriminative for his masculine behavior in the clinic, this stimulus control did not generalize to the mother's presence in the home.

In one situation, we did find evidence for generalization of treatment effects across stimulus environments: within the clinic, across social stimulus conditions, from the mother to strangers.

In general, it may be concluded that the treatment effects tended to be narrowly specific to the particular stimulus environment in which they were introduced. When generalization did occur, however, it was where it would be most expected: where the stimulus environments were quite similar. These findings are consistent with Wahler's (1969) study (among several others) which found the effects of child behavior therapy to be setting-specific; Wahler reported that treatment effects in the home did not generalize to the same behaviors in the school.

To facilitate optimal therapeutic effects, therefore, it became necessary to treat each feminine behavior individually in the major settings in which they occurred. This implies that the traditional delivery model of psychological services, that limits itself to "office visits" by the patient, ought to have only limited effects on childhood cross-gender problems. For optimal effects, aspects of the young child's entire environment must be changed; this consideration makes it necessary for parents to serve as the therapeutic agents in the natural environment. In Kraig's case, treatment was very extensive, involving numerous home visits by clinic staff and the maintenance of a "24-hour" therapeutic environment over an extended period of time. This unusually intensive treatment required the sustained efforts of the mother, active cooperation from the father, and frequent home consultation from the clinic staff.

It is possible that the amount of response generalization obtained (like the amount of stimulus generalization) is a function of which particular response is treated in what stimulus situation. For example, treating peer-play at home might be more productive in terms of resultant generalization than treating doll-play in the clinic. Our treatment of Kraig raises these issues for further research.

Theoretical Implications

Three major types of theories have been proposed to explain the fundamental antecedents and underlying mechanisms involved in sex-role development: (1) The social-learning theory uses experimentally-derived principles of learning to explain the process of sex-typing. Differential

and selective rewards and punishments, extinction, generalization, discrimination, modeling and vicarious learning are viewed as the central factors in sex-role development. (2) Concepts of "identification" have been theorized as the means by which broad pervasive aspects of personality and character, such as sex-typing, are assimilated. The several versions of this dispositional approach to sex-typing have been recently reviewed by Mischel (1970) and Mussen (1969). (3) According to Kohlberg's (1966, 1969) "cognitive-developmental theory," the development of sex-typing is one aspect of the child's cognitive growth, i.e., his active selection and structuring of his perceptions, knowledge and understanding. The child's self-categorization as "boy" or "girl" (his basic sexual self-concept) becomes the major organizer and determinant of his gender-related activities, values, and attitudes.

We prefer a social-learning theory interpretation of our data over the alternatives, primarily because the social-learning hypothesis includes the possibility that cross-gender behaviors may be stimulus-specific and response-specific. Our data is consistent with Mischel's (1970) argument that the organization of sex-role behavior is much more subtly differentiated than the broad unitary dispositional theories of "identification" suggest. Kraig's behavior across settings and across responses was far from homogeneous as the "identification" hypothesis would require. It is likewise difficult to explain our data on Kraig solely in terms of the "cognitive-developmental theory" which tends to assume a strong unidirectional causal role of cognitive processes in determining sex-typed behavior. The major difference between current social learning models and the cognitive-developmental theory hinges on the strong emphasis that Kohlberg's formulations place on the causal role of self-categorization as male or female, and the related cognition. Social-learning theory does not insist that the individual's cognitions and self concepts about sex-role identity necessarily parallel his other behaviors; nor does the social learning viewpoint hold that such cognitions necessarily cause other sex-related behaviors. According to the social-learning hypothesis, certain environmental events may become discriminative for the performance of specific gender-related behaviors, insofar as

reinforcement may be delivered in some situations and not in others. Many variables may interact with the sex of the child to determine the probable direct and vicarious consequences to which various sex-typed behaviors are likely to lead in various stimulus situations.

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Footnotes

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[2]This manuscript was written while Dr. Rekers held a Postdoctoral Fellowship in Clinical Psychology from the Foundation's Fund for Research in Psychiatry. Requests for reprints of this article should be addressed to Dr. Ivar Lovaas, U.C.L.A. Psychology Department, 405 Hilgard Avenue, Los Angeles, California 90024.

TABLE 1

Examples of Feminine, Masculine, and Neutral Words
for Categorical Scoring of Verbal Phrases

Feminine Category

1. Feminine objects:
   Girls' toys; dolls; jewelry items; hairstyles; cosmetics; dresses; perfume
2. Feminine persons:
   Queens; actresses; mother; sister; nurses; girls; women
3. Feminine activities:
   Sewing; caring for babies; applying makeup; putting on a dress; playing female role

Masculine Category

1. Masculine objects:
   Boys' toys; guns; building tools; cars; baseball; football shoes
2. Masculine persons:
   Kings; actors; father; brother; soldiers; policemen; firemen; boyscouts; boys; men
3. Masculine activities:
   Camping; playing sports; piloting an airplane; driving a truck; hunting deer

Neutral Category

1. Neutral objects:
   Plants; television; puzzles; telephone; camera; crayons; raincoat; cat; dog; food
2. Neutral persons:
   A crowd; a burglar; a teacher; a swimmer; a baby (whenever the gender of the individual is left unspecified)
3. Neutral activities:
   Watching television; drawing pictures; bicycle riding; eating; going to school

TABLE 2

Schematic Diagram of the Ordering of Sessions
in the Clinic Study of Reinforcement Control

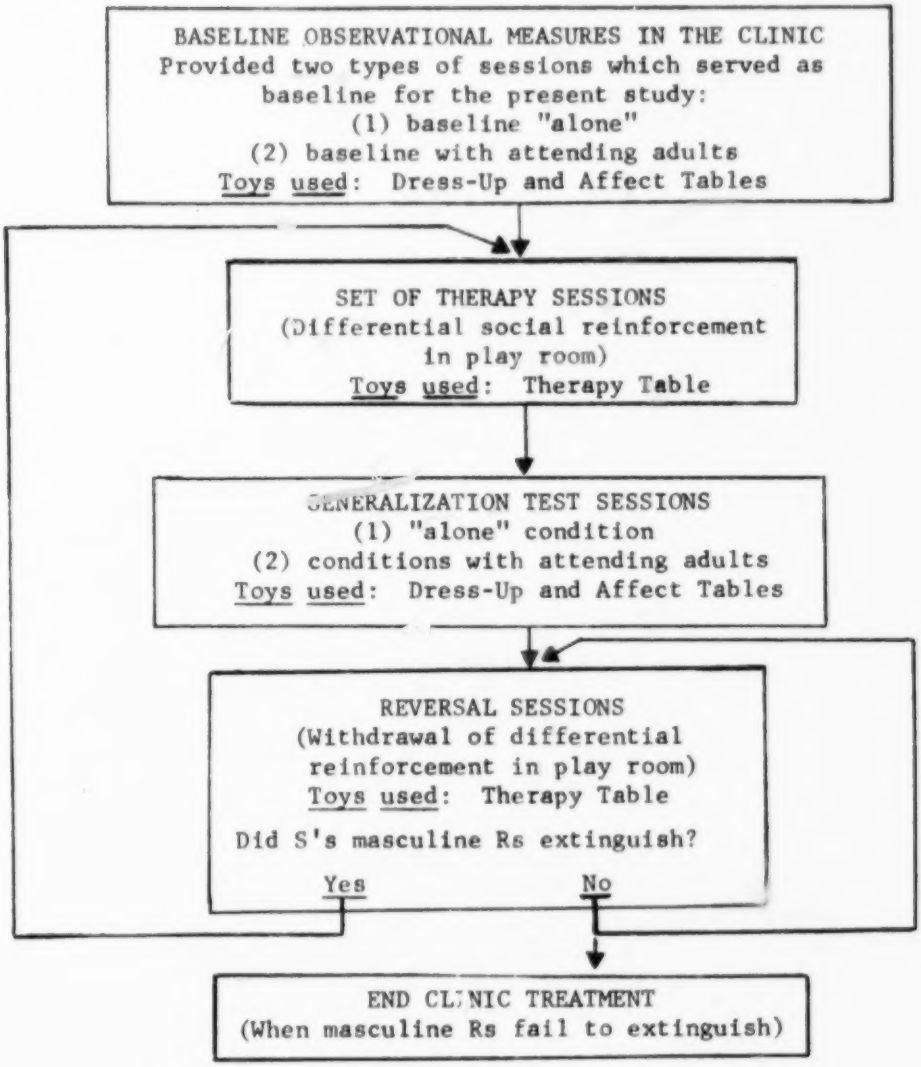

BASELINE OBSERVATIONAL MEASURES IN THE CLINIC
Provided two types of sessions which served as baseline for the present study:
(1) baseline "alone"
(2) baseline with attending adults
Toys used: Dress-Up and Affect Tables
SET OF THERAPY SESSIONS
(Differential social reinforcement in play room)
Toys used: Therapy Table
GENERALIZATION TEST SESSIONS
(1) "alone" condition
(2) conditions with attending adults
Toys used: Dress-Up and Affect Tables
REVERSAL SESSIONS
(Withdrawal of differential reinforcement in play room)
Toys used: Therapy Table
Did S's masculine Rs extinguish?
Yes
No
END CLINIC TREATMENT
(When masculine Rs fail to extinguish)

Figure Captions

Figure 1. Per cent feminine and masculine verbal and play behavior as a function of mother's social reinforcement contingency in the clinic playroom.

Figure 2. Per cent feminine behavior per week as a function of token reinforcement intervention in the home.

Figure 1

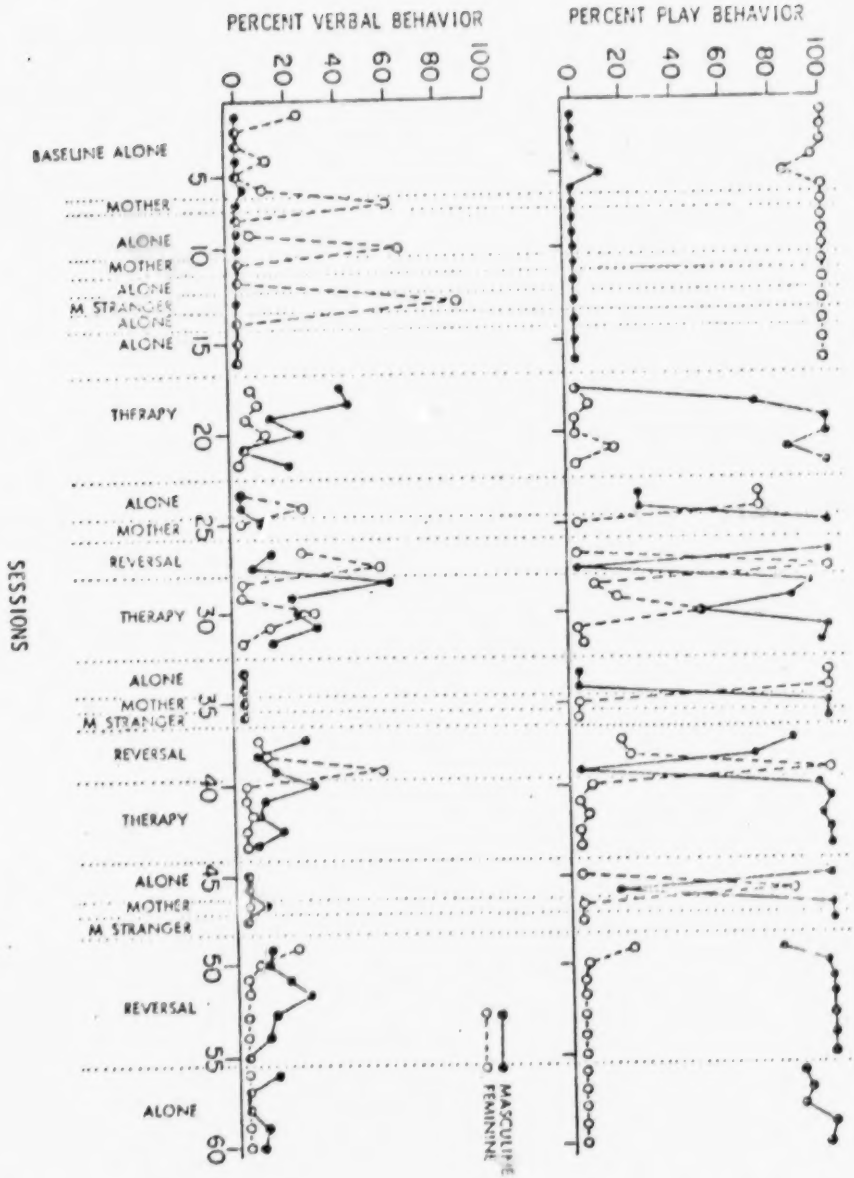
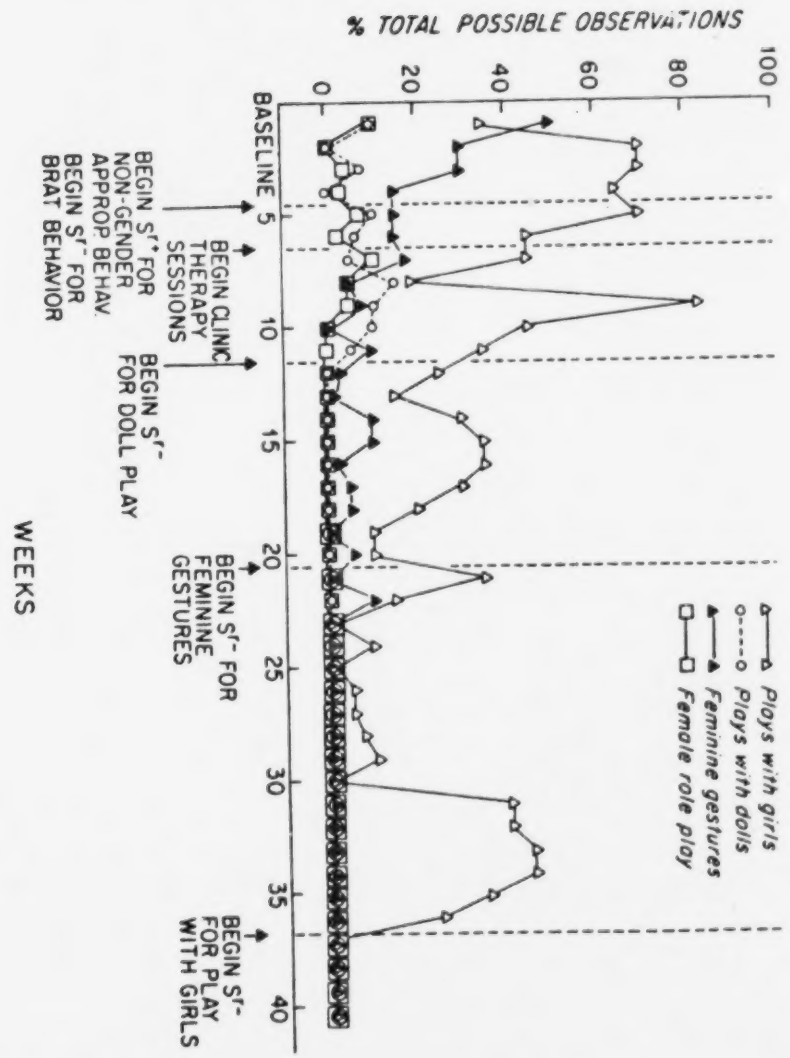

PERCENT VERBAL BEHAVIOR
PERCENT PLAY BEHAVIOR
0
20
40
60
80
100
SESSIONS
BASELINE ALONE
MOTHER
ALONE
MOTHER
ALONE
M. STRANGER
ALONE
ALONE
THERAPY
ALONE
MOTHER
REVERSAL
THERAPY
ALONE
MOTHER
M. STRANGER
REVERSAL
THERAPY
ALONE
MOTHER
M. STRANGER
REVERSAL
ALONE
MASCULINE
FEMININE

Figure 2


% TOTAL POSSIBLE OBSERVATIONS
100
80
60
40
20
0
BASELINE 5
10
15
20
25
30
35
40
WEEKS
BEGIN S's FOR NON-GENDER APPROP BEHAV.
BEGIN S's FOR BRAT BEHAVIOR
BEGIN CLINIC THERAPY SESSIONS
BEGIN S's FOR DOLL PLAY
BEGIN S's FOR FEMININE GESTURES
BEGIN S's FOR PLAY WITH GIRLS
Plays with girls
Plays with dolls
Feminine gestures
Female role play